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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,781	09/28/2001	Nobuhiro Yasui	35.C15831	3026

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EXAMINER

KOPPIKAR, VIVEK D

ART UNIT PAPER NUMBER

1775

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/964,781

Applicant(s)

YASUI ET AL.

Examiner

Vivek D Koppikar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/17/03.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-36 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-14 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/28/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

FINAL OFFICE ACTION

Election/Restrictions

1. The Election of Claims 1-36 and the cancellation of Claims 37-43 in Paper No. 8 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1,020,545 to Iwasaki, and in view WO 99/24973 to Lambeth and Japanese Publication Number 01-176318 (hereafter referred to as JP'318).

With regard to Claims 1-2, Iwasaki teaches an aluminum oxide layer (13) with holes (14) which is applied over a substrate (11). The aluminum oxide layer (13) is used in magnetic recording media (Col. 2, Ln. 33-35 and Col. 4, Ln. 31-40). In one embodiment of the invention, there is a conductive layer (18), composed of metal, in between the aluminum oxide layer (13) and the substrate (11) (Col. 13, Ln. 2-6 and Ln. 19-21, and Figure 5A). The aluminum oxide layer has pores (14) present which come in contact with the conductive layer (18) (Figure 5B). The pores are filled with a magnetic filler (Col. 6, Ln. 48-54, Col. 12, Ln. 55-Col. 13, Ln. 6 and Figure 5A). As is illustrated in Figure 5B the pores (14) contact the conductive layer (18) so once the pores are filled the magnetic filler will contact the conductive layer (18).

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Iwasaki does not teach that the metallic substance which fills the pores has an hcp structure in which the c-axis is oriented in a direction perpendicular to the substrate.

JP'318 teaches a perpendicular magnetic recording medium with an aluminum oxide layer. Pores are formed the aluminum oxide layer by anodic oxidation and they are filled with a cobalt alloy. Using Co alloys result in excellent electromagnetic transducing properties. JP'318 does not state that this cobalt alloy (a hard magnetic substance) has an hcp structure in which the c-axis is oriented in a direction perpendicular to the substrate. Lambeth teaches Co alloys which have an hcp structure along the c-axis and in which the c-axis is perpendicular to the plane of the substrate. These Co alloys exhibit high coercivity in magnetic media (Page 9, Ln. 8-15 and Page 12, Line 14-16).

At the time of the invention one of ordinary skill in the art would have been motivated to fill the pores (14) of Iwasaki with a hard Co alloy as taught in JP'318 with the expectation of improving the electromagnetic transducing properties of the magnetic recording medium and use an hcp Co alloy as taught in Lambeth with the expectation of obtaining a magnetic recording medium with a high coercivity.

With regard to Claim 3, the holes in the aluminum oxide layer of Iwasaki are produced from anodic oxidation (Col. 2, 2-7).

With regard to Claim 4, the base electrode layer (18) in Iwasaki is an electrode (Col. 13, Ln. 2-6).

With regard to Claim 5, Iwasaki teaches that the conductive layer is made from a metal (Col. 13, Ln. 7-10). The examiner takes the position that this includes copper.

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With regard to Claims 7-9, in one embodiment of Lambeth the portion of the magnetic recording substance that touches the conductive layer is made of either copper or NiFe (Page 17, Ln. 28-Page 18, Ln. 7). Adding these metals to a cobalt alloy results in a magnetic recording with lower noise. Therefore at the time of the invention one of ordinary skill in the art would have been motivated to use one of these cobalt alloys as the metallic filler in Iwasaki with the expectation of obtaining a magnetic recording medium with reduced noise.

With regard to Claim 10, Lambeth teaches that the magnetic layers and the intermediate layers (conductive layers) of the recording medium are given epitaxial growth so that the grain sizes can be controlled (Page 12, Ln. 4-10). Therefore at the time of the invention one of ordinary skill in the art would have been motivated to make the conductive and magnetic layers in Iwasaki epitaxial growth layers with the expectation of having more control over the grain size of the magnetic recording medium.

With regard to Claim 11, Lambeth teaches applying a soft magnetic layer under the conductive layers in order to reduce noise (Page 17, Ln. 28-35). Therefore at the time of the invention one of ordinary skill in the art would have added a soft magnetic layer under the conductive layer in Iwasaki with the expectation of reducing noise in the magnetic recording medium.

With regard to Claims 12 and 13, Iwasaki teaches that the holes in the aluminum oxide layer can be arranged in either a honeycomb or rectangular array (Col. 2, Ln. 1-5, and Col. 10, Ln. 43-49).

With regard to Claim 14, the magnetic recording medium of Iwasaki is used in a magnetic recording apparatus ([0029]).

Response to Arguments

5. The claim objections set forth in the Office Action dated March 14, 2003 have been withdrawn. The amendments filed on July 17, 2003 overcome these objections.
6. Applicant's arguments presented in the response filed on July 17, 2003 with respect to claims 1-13 have been considered but are moot in view of the new ground of rejection.
7. Applicant's arguments presented in the response filed on July 17, 2003 with respect to Claims 15-35 have overcome the 35 USC 103 rejections and the claims are allowable.

Allowable Subject Matter

8. Claim 6 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest a magnetic recording medium which consists of which consists of a porous layer in contact with a conductive layer in which the filling that fills the pores in the conductive layer has an fcc structure with its (111) face oriented in a perpendicular direction to the substrate.

In JP'318 the pore filling is cobalt and cobalt has an hcp structure (Lambeth, Page.8, Ln. 31-Page 9, Ln. 14).
10. Claims 15-36 are allowable over the prior art of record.
11. The following is a statement of reasons for the indication of allowable subject matter:

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The prior art of record does not teach a magnetic recording medium which consists of a substrate, a conductive layer on top of the substrate and an aluminum oxide above the substrate in which the magnetic filler which fills the pores has an Ll_0 structure.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Vivek Koppikar** whose telephone number is **(703) 305-6618**. The examiner can normally be reached on Monday-Friday from 8 AM to 5 PM, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones, can be reached at (703) 308-3822. The fax phone numbers for the organization where this application or proceeding are assigned are (703) 305-7718 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Vivek Koppikar
Vivek Koppikar

9/22/03

Deborah Jones
DEBORAH JONES
SUPERVISORY PATENT EXAMINER
RECEIVED
DEBORAH JONES